REMARKS

Claims 1-26 are presented for further examination.

In the first Office Action mailed May 17, 2007, the Examiner rejected claims 1-2, 5-8, 10-12, 14, and 18-19 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,493,378 ("Zhodzishsky et al.") in view of U.S. Patent Publication No. 2004/0202235 ("Kohli et al."). Claim 20 was rejected as obvious over Kohli et al. in view of U.S. Patent No. 7,187,742 ("Logue et al."). Claim 24 was rejected as obvious over Kohli et al. in view of U.S. Patent No. 7,010,022 ("Sousa et al."). Claim 3-4, 9, 13, 15-17, 21-23, and 25-26 were found to be allowable if rewritten into independent form.

Applicant respectfully disagrees with the basis for the rejections and requests reconsideration and further examination of the claims.

The primary reference relied upon by the Examiner, Zhodzishsky et al., U.S. Patent No. 6,493,378, is directed to methods and apparatuses for reducing multipath errors in the demodulation of pseudo-random coded signals. The Examiner cites Figure 2 and quotes from column 9, lines 58-65, in which Zhodzishsky et al. describe a filtered broadcast signal 12 that is provided to the input of a quadrature analog-digital converter having two multipliers 130a and 130b, and a local oscillator 133, in which a received broadcast signal is digitized to produce a received digitized signal, and again at column 9, lines 65-66, in which two analog-to-digital converters 132a and 132b are used. The Examiner acknowledges that Zhodzishsky et al. fail to disclose correlating a received digitized signal with a local version of a repeated code using a clock derived coherently from a master clock source for a first time period to produce a first result, correlating the received digitized signal with a local version of the repeated code using the clock derived coherently from the master clock source for a second time period separated from the first time period by a separation period to produce a second result, and combining the first and second correlation result by comparing the location of correlation peaks to reject peaks not appearing at the same position in both the first and second correlation results to thereby acquire the broadcast signal (as recited in claim 1).

For the missing elements of claim 1, the Examiner relies upon a secondary reference, Kohli et al., U.S. Patent Publication No. 2004/0202235, which is directed to a spread spectrum receiver with multi-bit correlator.

The Examiner refers to specific portions of Kohli et al. (page 4, paragraphs 40, 42, and 47) as disclosing the first and second correlation periods. However, these portions of Kohli et al., and indeed the entire reference, is concerned with a GPS receiver operating in a tracking mode. In contrast, claim 1 is directed to a method of acquiring a received broadcast signal. As explained in more detail in the present specification, the modes of acquiring and tracking are different modes utilizing different circuits and processes. The initial acquisition of a GPS satellite signal is the most time-intensive portion of operation. The present disclosure reduces this period by avoiding off-frequency cross-correlation with other GPS satellites.

Cross-correlation occurs because the GPS device constantly receives signals from multiple satellites. This can lead to performance degradation as correlation of multiple signals with a locally generated version produces extraneous peaks. In particular, this is caused by a failure to distinguish between signals having substantially the same frequency yet having small differences due to, for example, Doppler shift. The foregoing is explained in more detail in the background portion of the specification.

One of ordinary skill in the art would not consult a document that is concerned with tracking, rather than initial acquisition, which are regarded as distinct modes of operation with their own related problems. Kohli et al. is simply not relevant to the present disclosure and the claimed method and related receiver.

Even if one of ordinary skill were to examine the Kohli et al. reference, they would find no motivation to modify Zhodzishsky et al. in order to produce the present claimed invention. The portions of Kohli et al. referred to by the Examiner deal with multipath signals originating with a same satellite (see page 4, paragraph 38 of Kohli et al.), where copies of the signal are received over a multiplicity of different paths (see Kohli et al., page 1, paragraph 12). This is very different than the purpose of the present disclosure, which seeks to prevent cross-correlation with multiple signals originating from different satellites.

Kohli et al. mention at paragraph 40, for example, the well-known use of early and late measurements, which are used to maintain tracking position with a particular time window and how these are affected by multiple path signals.

Turning to the claims, claim 1 requires that two correlations be performed with the received code at different time periods. The Examiner states in his remarks that he equates

the first correlation result with the "early correlation" of Kohli et al., and the second correlation result is equated with the "late correlation" of Kohli et al. In fact, there is no teaching or suggestion in Kohli et al. that the early and late correlations are performed at different time periods. The terms "early" and "late" as used by Kohli et al. do not refer to the time period during which the correlation is performed. Rather, they pertain to the displacement introduced into the locally generated versions of the satellite signal. Page 10, paragraph 20, indicates that these correlations are performed in parallel, *i.e.*, at the same time.

This is a clear distinction from the present claimed method in which correlating the received digitized signal with a local version of a repeated code using a clock derived coherently from a master clock source is done for a first time period to produce a first result and done for a second time period separated from the first time period by a separation period to produce a second result.

Continuing on, the Examiner next refers to page 5, paragraph 52, and page 10, paragraph 124, of Kohli et al., asserting the reference discloses the features of the final paragraph of claim 1, which is combining the two correlations to eject peaks not appearing in the same positions in both correlations. This is simply not accurate, and applicant is unsure if the final paragraph of claim 1 has been appreciated. According to the present disclosure, a correlation is performed on a received signal at a first time and a second correlation is performed at a second time. The final portion of claim 1 states that the location of correlation peaks in the first and second correlation results are compared, and peaks that do not appear at the same code positions are rejected. In this way, the present disclosure as recited in claim 1 is able to distinguish a signal peak originating due to a correlation with a signal from the target satellite and a false correlation with a different Doppler-shifted signal.

Kohli et al. make use of the early and late correlation results. These are well-known correlations performed during tracking mode to maintain a fix on a satellite signal. Essentially, when a signal is locked after acquisition, synchronization is maintained by performing parallel correlations with locally generated "shifted" signals (referred to as "early" or "late" correlation signals). Should the signals start to drift, one of the shifted signals will start to correlate with the received signal.

There is no consideration in Kohli et al. or in Zhodzishsky et al., taken alone or in any combination thereof, of rejecting peaks that are not located at the same location of subsequent correlations. At no point during operation of the system of Kohli et al. are the early and late correlation results combined by comparing the location of correlation peaks in order to reject peaks that are in differing positions. To do so would be meaningless in Kohli et al. because in tracking mode it is unlikely that the early and late correlations will share peaks since the received signal is correlated with locally generated "shifted patterns." By definition, if one is correlated, the other shifted signals cannot be, and therefore they will not share peaks.

Furthermore, the addition of samples (discussed at page 10, paragraph 124 of Kohli et al.) does not amount to comparing peak positions. This simply means that several samples of the same correlation are added to produce a value indicating the correlation of the input signal with a shifted, locally generated signal. This merely identifies which of the shifted signals best correlates with the received signal and, therefore, what shift is required to synchronize the received signal and the locally generated version of the received signal.

Thus, applicant respectfully submits that claim 1 is clearly allowable over the combination of Zhodzishsky et al. and Kohli et al.

Dependent claims 2-11 are allowable for the features recited therein as well as for the reasons why claim 1 is allowable.

Claim 12 is directed to a system arranged to acquire a received broadcast signal, and it recites, *inter alia*, "a correlator arrangement arranged to receive the digitized signal and the correlation clock and to correlate the received digitized signal with a stored copy of the repeated code for at least two integration periods separated by a separation period." (Emphasis added). Claim 12 further recites "a comparator arranged to compare the results of the at least two correlations by comparing the location of integration peaks to reject peaks not appearing at the same position in the results of the at least two integrations." (Emphasis added).

Applicant respectfully submits that claim 12 is clearly allowable for the reasons discussed above with respect to claim 1. Dependent claims 13-19, all of which depend ultimately from claim 12, are allowable for the features recited therein as well as for the reasons why claim 12 is allowable.

Independent claim 20 is directed to a receiver for acquiring a received broadcast signal and independent claim 24 is directed to a method of acquiring a received broadcast signal. Both of these independent claims include a step or component configured to produce two correlation results, *e.g.*, a first result and a second result as recited in claim 24, and to combine these results for comparison to reject correlation peaks not appearing at the same position in the two results. Applicant respectfully submits that these two independent claims are allowable for the reasons discussed above with respect to claim 1. Dependent claims 21-23, which depend from claim 20, and dependent claims 25-26, which depend from claim 24, are allowable for the features recited therein as well as for the reasons why their respective independent claims from which they depend are allowable.

In view of the foregoing, applicant respectfully submits that all of the claims in this application are clearly in condition for allowance. In the event the Examiner disagrees or finds minor informalities that can be resolved by telephone conference, the Examiner is urged to contact the below-listed counsel of record in order to expeditiously resolve prosecution of this application. Consequently, early and favorable action allowing these claims and passing this case to issuance is respectfully solicited.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

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